CLAIMS

What is claimed is:

1. A method for combining a plurality of 3D volume data sets in a single output 3D volume data set, each 3D volume data set comprising a plurality of voxels, each voxel comprising a data value and being positioned at a 3D location in a respective 3D volume data set, said method comprising the steps of:

selecting a first 3D volume data set;

selecting a second 3D volume data set;

comparing each of said data values in at least one of said first 3D volume data set and said second 3D volume data set with a preselected data value range;

inserting at least one of a preselected data value at a position corresponding with said respective data value in said output 3D volume data set for each compared data value that is within said data value range, and another preselected data value at a position corresponding with said respective data value in said output 3D volume data set for each compared data value that is not within said data value range; and

displaying at least one section of said output 3D volume data set.

2. The method of Claim 1, wherein said preselected data value and said another preselected data value are each related to at least one of a first attribute and a second attribute.

3. The method of Claim 1, wherein said preselected data value is identical to said compared data value from said at least one of said first 3D volume data set and said second 3D volume data set that is within the data value range.

4. The method of Claim 1, wherein said another preselected data value is identical to said compared data value from said at least one of said first 3D volume data set and said second 3D volume data set that is not within the data value range.

5. The method of Claim 1, further comprising the steps of:

inserting a seed pick in said display for determining an event related to a physical phenomena, said seed pick being positioned at a respective data value position using said display; and

auto-picking all data values connected to said seed pick which have the same data value as said respective data value at which said seed pick is positioned.

6. A program storage device readable by a machine embodying a program of instructions executable by the machine to perform method steps of imaging an output 3D volume data set, the output 3D volume data set comprising a plurality of voxels, each voxel comprising a 3D coordinate and a data value, the method comprising the steps of:

selecting a 3D volume data set, the 3D volume data set comprising a plurality of voxels, each voxel comprising a 3D coordinate and a data value;

comparing each of said data values in said 3D volume data set with a preselected criteria;

inserting at least one of a preselected data value at a coordinate corresponding with said respective data value in said output 3D volume data set for each compared data value that meets said preselected criteria, and another preselected data value at a coordinate corresponding with said respective data value in said output 3D volume data set for each compared data value that does not meet said preselected criteria; and

displaying at least one section of said output 3D volume data set.

7. The program storage device of Claim 6, wherein said preselected data value and said another preselected data value are each related to at least one of a plurality of attributes.

8. The program storage device of Claim 6, wherein said preselected data value is identical to said compared data value from said 3D volume data set that meets said criteria.

9. The program storage device of Claim 6, wherein said another preselected data value is identical to said compared data value from said 3D volume data set that does not meet said criteria.

10. A method for displaying an enhanced 3D volume data set related to one of a plurality of attributes using a 3D volume data set comprising a plurality of voxels, each voxel comprising a data value and being positioned at a 3D location in said 3D volume data set, said method comprising the steps of:

comparing each data value from said 3D volume data set with a preselected data value range;

inserting at least one of a preselected data value at a position corresponding with said respective data value in said enhanced 3D volume data set for each compared data value that is within said data value range, and another preselected data value at a position corresponding with said respective data value in said enhanced 3D volume data set for each compared data value that is not within said data value range; and

displaying at least a section of said enhanced 3D volume data set.

11. The method of Claim 10, wherein said preselected data value and said another preselected data value are each related to at least one of said plurality of attributes.

12. The method of Claim 10, wherein said preselected data value is identical to said compared data value from said 3D volume data set that is within said data value range.

13. The method of Claim 10, wherein said another preselected data value is identical to said compared data value from said 3D volume data set that is not within said data value range.

14. The method of Claim 10, further comprising the steps of:

utilizing said display for inserting a seed pick at a selected event shown in said display; and

auto-picking a plurality of data values connected to said seed pick which have a data value identical to said seed pick data value at which said seed pick is positioned for automatically determining an extent of said event.

15. A program storage device readable by a machine embodying a program of instructions executable by the machine to perform method steps of combining a plurality of 3D volume data sets in a single output 3D volume data set, each 3D volume data set comprising a plurality of voxels, each voxel comprising a data value and being positioned at a 3D location in the respective 3D volume data set, said method comprising the steps of:

selecting a first 3D volume data set;

selecting a second 3D volume data set;

comparing each of said data values in at least one of said first 3D volume data set and said second 3D volume data set with a preselected data value range;

inserting at least one of a preselected data value at a position corresponding with said respective data value in said output 3D volume data set for each compared data value that is within said data value range, and another preselected data value at a position corresponding with said respective data value in said output 3D

volume data set for each compared data value that is not within said data value range; and

displaying at least one section of said output 3D volume data set.

16. The program storage device of Claim 15, wherein said preselected data value and said another preselected data value are each related to a at least one of a first attribute and a second attribute.

17. The program storage device of Claim 15, wherein said preselected data value is identical to said compared data value from said at least one of said first 3D volume data set and said second 3D volume data set that is within said data value range.

18. The program storage device of Claim 15, wherein said another preselected data value is identical to said compared data value from said at least one of said first 3D volume data set and said second 3D volume data set that is not within said data value range.

19. The program storage device of Claim 15, further comprising the steps of:

inserting a seed pick in said display for determining an event related to a physical phenomena, said seed pick being positioned at a respective data value position using said display; and

auto-picking all data value connected to said seed pick which have the same data value as said respective data value at which seed pick is positioned.